





1           7. The microphone array apparatus as  
claimed in claim 6, wherein:  
          a target sound source is a speaker; and  
          the linear predictive analysis unit updates  
5   the filter coefficients of the linear predictive  
filters by using a signal which drives the speaker.

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          8. A microphone array apparatus comprising:  
          a microphone array including microphones;  
          a signal estimator which estimates positions  
of estimated microphones in accordance with intervals  
15   at which the microphones are arranged by using the  
output signals of the microphones and a velocity of  
sound and which outputs output signals of the  
estimated microphones together with the output signals  
of the microphones forming the microphone array; and  
20   a synchronous adder which pulls phases of  
the output signals of the microphones and the  
estimated microphones and then adds the output  
signals.

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          9. The microphone array apparatus as  
claimed in claim 8, further comprising a reference  
30   microphone located on an imaginary line connecting the  
microphones forming the microphone array and arranged  
at intervals at which the microphones forming the  
microphone array are arranged,

          wherein the signal estimator which corrects  
35   the estimated positions of the estimated microphones  
and the output signals thereof on the basis of the  
output signals of the microphones forming the

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1 microphone array.

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10. The microphone array apparatus as claimed in claim 9, further comprising an estimation coefficient decision unit weights an error signal which corresponds to a difference between the output signal of the reference microphone and the output signals of the signal estimator in accordance with an acoustic sense characteristic so that the signal estimator performs a signal estimating operation on a band having a comparatively high acoustic sense with a comparatively high precision.

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11. The microphone array apparatus as claimed in claim 8, wherein:

given angles are defined which indicate directions of a sound source with respect to the microphones forming the microphone array;

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the signal estimator includes parts which are respectively provided to the given angles;

the synchronous adder includes parts which are respectively provided to the given angles; and

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the microphone array apparatus further comprises a sound source position detector which outputs information concerning the position of a sound source based on a maximum value among the output signals of the parts of the synchronous adder.

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1 12. A microphone array apparatus  
 comprising:  
 a microphone array including microphones;  
 a sound source position detector which  
 5 detects a position of a sound source on the basis of  
 output signals of the microphones;  
 a camera generating an image of the sound  
 source;  
 a second detector which detects the position  
 10 of the sound source on the basis of the image from the  
 camera; and  
 an integrate decision processing unit which  
 outputs information indicating the position of the  
 sound source on the basis of the information from the  
 15 sound source position detector and the information  
 from the second detector.

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